REMARKS

Applicant thanks the Examiner for a thorough search and examination, as well as the withdrawal of the previous rejections under 35 U.S.C. §§ 101 and 112, but respectfully requests reconsideration of the present application in view of the reasons that follow.

For simplicity and clarity purposes in responding to the Office Action, the Applicant's remarks are primarily focused on the rejections of the independent claims (i.e., 11 and 20) outlined in the Office Action with the understanding that the dependent claims that depend from the independent claims are patentable for at least the same reasons (and other reasons) that the independent claims are patentable. The Applicant expressly reserves the right to argue the patentability of the dependent claims separately in any future proceedings.

Legal Standard – 35 U.S.C. § 102(b)

Claims 11, 16, 20, and 22 have been rejected under 35 U.S.C. § 102(b), which states:

> A person shall be entitled to a patent unless (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent.

Under 35 U.S.C. § 102, a claim is anticipated, i.e., rendered not novel, when a prior art reference discloses every limitation of the claim. In re Schreiber, 128 F.3rd 1473, 1477 (Fed. Cir. 1997). "Rejections under 35 U.S.C. § 102[] are proper only when the claimed subject matter is **identically** disclosed or described in the prior art." In re Arkley, Eardley, and Long, 172 U.S.P.Q. 524, 526 (CCPA 1972) (*emphasis added*). Recently, in Net MoneyIn, Inc. v. VeriSign, Inc., the Federal Circuit held that the test for anticipation by a single reference under 35 U.S.C. § 102 requires that a single reference not only disclose all elements of the invention, **but that all the elements be arranged or combined in the same way as in the claim**. No. 2007-1565 ((Fed. Cir. 10/20/2008) (Fed. Cir., 2008)).

<u>**Independent Claim 11**</u>

As stated in the 35 U.S.C. § 102 legal standard section, the Examiner must comply with all claim limitations standard to establish a *prima facie* basis to deny patentability to the claimed invention under 35 U.S.C. § 102.

Claim 11 recites:

> 11. Machine readable media having stored therein a set of instructions that when executed cause a computer to implement a process for determining a probability of an adverse event in connection with a plurality of loans, the plurality of loans having varying amounts of loan data available, the process comprising:
>
> [A] constructing a first mathematical model for use with loans for which loan data is available for a set of explanatory variables, **the set of explanatory variables including variables that relate to risk characteristics of the loan, risk characteristics of collateral for the loan,** and risk characteristics of a borrower associated with the loan;
>
> [B] **constructing a second mathematical model for use with loans for which at least some of the loan data for the set of explanatory variables is not available,** including
>
> [i] **estimating the probability of the adverse event for a first group of loans** for which the loan data is available for the set of explanatory variables **using the first mathematical model,**
>
> [ii] **iteratively estimating the probability of the adverse event for the first group of loans using the second mathematical model,**
>
> [iii] **selecting an optimal set of weighting coefficients for the second mathematical model, the optimal set of coefficients being selected so as to minimize errors in outputs generated by the second mathematical model for the first group of loans relative to outputs generated by the first mathematical model** for the first group of loans, and

[iv] **storing a set of error values,** the set of error values relating to the errors in the outputs generated by the second mathematical when using the optimal set of coefficients **relative to the outputs generated by the first mathematical model**; and

[C] **estimating the probability of the adverse event for a second group of loans** using the second mathematical model, wherein at least some loan data for the set of explanatory variables is not available for the second group of loans, and wherein estimating the probability of the adverse event for the second group of loans includes **randomly drawing error values from the set of error values and adjusting the outputs of the second mathematical model for the second group of loans in accordance with the randomly drawn error values, the randomly drawn error values causing a distribution of the probability values produced by the second mathematical model for the second group of loans to more closely match a distribution of the probability values produced by the first mathematical model for the first group of loans.**

(Applicant notes that, for sake of facilitating the present discussion only, each of the steps has been designated [A], [B][i]-[B][iv], and [C], respectively.)

First, Keyes et al. neither teaches nor suggests claim 11 because Keyes et al. fails to teach or suggest " constructing a first mathematical model..." **and** "constructing a second mathematical model for use with loans for which at least some of the loan data for the set of explanatory variables is not available." Hence, in the arrangement set forth in claim 11, first and second mathematical models are constructed. The second mathematical model is for use with loans for which at least some of the loan data for a set of explanatory variables is not available. As set forth in sub-steps [B][i]-[B][iv], the second mathematical model is constructed using outputs of the first mathematical model.

The Office Action relies on the Abstract and Column 1, line 53-Column 2, line 21 as alleged support for the assertion that both first and second mathematical models are taught. The Abstract of Keyes et al. indicates the following:

> A method of valuation of large groups of assets by partial full underwriting, partial sample underwriting and inferred values of the remainder using an iterative and adaptive supervised and unsupervised statistical evaluation of all assets and statistical inferences drawn from the evaluation and applied to generate the inferred values. Individual asset values are developed and listed in tables so that individual asset values can be rapidly taken from the tables and quickly grouped in any desired or prescribed manner for bidding purposes. The assets are collected into a database, divided into categories by credit variable, subdivided by ratings as to those variables and then rated individually. The assets are then regrouped according to a bidding grouping and a collective valuations established by cumulating the individual valuations.

Applicant submits that nothing in the Abstract of Keyes et al. teaches or suggests the construction of a first mathematical model or a second mathematical model as disclosed by independent claim 11 of the present application.

Column 1, line 53-Column 2, line 21 of Keyes et al. recites the following:

> In an exemplary embodiment, an iterative and adaptive approach is provided wherein a portfolio is divided into three major valuations. Full underwriting of a first type of valuation of an asset portfolio is performed based upon an adverse sample. A second valuation type is efficiently sampled from categories of common descriptive attributes, and the assets in the selective random sample are fully underwritten. The third valuation type is subjected to statistically inferred valuation using underwriting values and variances of the first and second portions and applying statistical inference to individually value each asset in the third portion. Clustering and data reduction are used in valuing the third portion.
>
> As the process proceeds and more assets are underwritten, the number of assets in the first and second portions increase and the number of assets in the third portion decreases and the variance of the valuation of the assets in the third portion becomes more and more defined. More specifically, the assets in the third portion are evaluated by grouping the assets into clusters based on similarity to valuations of assets in the first and second portions.
>
> A method for predicting value of non-underwritten assets for which data representations are partial or incomplete by projecting

> values onto the non-underwritten assets from at least one of fully underwritten assets, other non-underwritten assets with complete data representations and available data from non-underwritten assets with partial or incomplete data representations having similar identifiable characteristics is disclosed. The method includes the steps of sampling assets according to risk, underwriting assets and recording valuations, forming market value clusters, building regression models for underwritten assets, selecting the best models for the underwritten assets, counting a number of times the models are selected and using the selected model to make a prediction of underwriting value for the non-underwritten assets.

At best, Column 2, lines 7-21 of Keyes et al. describes a method for predicting values of non-underwritten assets for which data representations are partial or incomplete by the projection of values from at least one fully underwritten asset to the non-underwritten assets. Moreover, the above section of Keyes et al. merely suggests that models (i.e., regression models) are constructed for the underwritten assets, where such regression models are selected to make predictions of underwriting value for the non-underwritten assets.

In light of the above, Applicant submits that at best, Keyes et al. only teaches the construction of a first mathematical model. Those non-underwritten assets for which data representations are partial or incomplete have no such "second mathematical model" constructed for estimating the probability of adverse events therewith.

Second, Keyes et al. does not teach or suggest claim 11 because Keyes et al. is explicitly limited to the risk assessment of a borrower. (*See, e.g.,* Column 3, lines 48-57 of Keyes et al.) In contrast, claim 11 requires that the construction of a first mathematical model for a set of explanatory variables including those that relate to: (1) risk characteristics of the loan; (2) risk characteristics of collateral for the loan; and (3) risk characteristics of a borrower associated with the loan. Hence, Keyes et al. fails to teach or suggest variables that relate to risk characteristics of the loan, as well as risk characteristics of collateral for the loan.

Third, Keyes et al. does not teach or suggest claim 11 because Keyes et al. does not suggest the specific steps for creating the second mathematical model based on the outputs of the first mathematical model as recited in claim 11. Specifically, claim 11 recites "estimating the probability of the adverse event for a first group of loans for which the loan data is available for the set of explanatory variables using the first mathematical model," "iteratively estimating the probability of the adverse event for the first group of loans using the second mathematical model," "selecting an optimal set of weighting coefficients for the second mathematical model, the optimal set of coefficients being selected so as to minimize errors in outputs generated by the second mathematical model for the first group of loans relative to outputs generated by the first mathematical model for the first group of loans," and "storing a set of error values, the set of error values relating to the errors in the outputs generated by the second mathematical when using the optimal set of coefficients relative to the outputs generated by the first mathematical model."

The Office Action relies upon Column 1, lines 60-65, Column 2, lines 14-21, and Column 6, lines 11-65 of Keyes et al. to support the Examiner's position that the above-described limitations of claim 11 are taught or suggested.

Column 1, lines 60-65 and Column 2, lines 14-32 have been quoted above. Applicant submits that nowhere in these sections of Keyes et al. can any description of estimating the probability of an adverse event be found. At best, Keyes et al. merely describes the valuation of underwritten assets and the predictive valuation of non-underwritten assets. However, none of the valuation described in Keyes et al. can be reasonably interpreted as having any relation to the probability of an adverse event occurring for a group of loans.

Column 6, lines 11-65 of Keyes et al. recites the following:

> Organizing valuation scores is performed by collating, in electronic form, a cluster number, a cluster name, descriptive attributes of the

cluster(s), probabilistic recovery values (an illustrative example is a HELTR score) and the underwriter's confidence in each cluster's valuation based upon the strengths of each cluster's descriptive attributes. The cluster number is a unique identifier of a specific set of descriptive attributes that are facts about an asset which a person skilled in evaluations uses to assess value of an asset. Examples of descriptive attributes include, but are not limited to, payment status, asset type, borrower's credit worthiness expressed as a score, location and seniority of a claim. The cluster name is, in one embodiment, an alpha-numeric name that describes the cluster's descriptive attributes or sources. One example of descriptive attributes is found in FIG. 12, described below.

Descriptive attributes are the facts or dimensions or vectors that were used to develop the asset's value. Computer logic is used to check for replicated clusters, if any, and alert the analysts or underwriters.

Because each asset can be described by many combinations of descriptive attributes, various levels of value for the same asset may occur. Probabilistic recovery values or credit score or any numerical indication of the asset's worth are indicators of worth designated at the discrete asset level. All of the information from the various descriptive attributes is synthesized such that a purchase or sale price can be ascertained as a fixed value or a probabilistic one. An illustrative embodiment used herein is the HELTR score. Each cluster has a unique set of descriptive attributes and designated HELTR score.

Every cluster's unique attributes contribute to a valuation of cluster value. Different combinations of attributes provide a higher confidence or confidence interval of a particular cluster's score. For example, if any asset was described as a green piece of paper with height equal to 2.5" and width equal to 5"--one might ascribe a value of 0 to 1000 dollars and place very little confidence in this assessment. If this same asset was described with one more fact or attribute or vector as being a real $20 US bill, one would place a very high confidence factor on this cluster value of $20 US dollars.

A cluster's valuation and confidence is determined at a point in time and recorded. Sometimes new information becomes available and the analyst would like to alter the value(s). The value is altered

> manually or automatically with a data field and decision rules, in the automated fashion via computer code. The prior values are manipulated to reflect new information. As an illustrative example, assume the prior cluster confidence was recorded at 0.1 and it is learned that a different asset with exact descriptive attributes as in this cluster just sold for over the predicted "most probable" value. Rules were in effect such that if this event occurred, cluster confidence is multiplied by 10. 0.1.times.10=1 which is the revised cluster confidence.

Applicant again submits that nowhere in the above-quoted section of Keyes et al. can any mention of the following features be found: iterative estimation of the probability of an adverse event; selection of "an optimal" set of weighting coefficients "to minimize errors in outputs generated by the second mathematical model; or storing a set of error values, where the set of error values relates to the errors in the outputs generated by the second mathematical model when using the optimal set of coefficients relative to the outputs generated by the first mathematical model. At best, Keyes et al. describes organizing valuation scores through the use of clusters that have certain descriptive attributes used to develop an asset's value, where confidence levels are assigned to clusters. As described at, e.g., Column 6, lines 42-65, the confidence levels may be interpreted to be some type of "weighting," but certainly **not** "weighting coefficients for the second mathematical model, the optimal set of coefficients being selected so as to minimize errors in outputs generated by the second mathematical model for the first group of loans relative to outputs generated by the first mathematical model for the first group of loans." Moreover, Applicant submits that Keyes et al. is devoid of any description of "error values," let alone error values that are stored and indicative of errors as described in claim 11. **The Office Action does not specifically address these limitations of claim 11. In the event that the rejection is maintained, clarification is respectfully requested.**

Finally, Keyes et al. does not suggest claim 11 because Keyes et al. does not suggest the use of error values in the manner set forth in claim 11. Specifically, claim 11 recites "estimating the probability of the adverse event for the second group of loans includes randomly drawing error values from the set of error values and adjusting the outputs of the second mathematical

model for the second group of loans in accordance with the randomly drawn error values, the randomly drawn error values causing a distribution of the probability values produced by the second mathematical model for the second group of loans to more closely match a distribution of the probability values produced by the first mathematical model for the first group of loans." Hence, in claim 11, the error values are used to cause the distribution of the probability values produced by the second mathematical model for the second group of loans to more closely match a distribution of the probability values produced by the first mathematical model for the first group of loans.

The Office Action relied upon Column 6, lines 4-10 of Keyes et al. to support the Examiner's position that each of the above-described limitations is anticipated. Column 6, lines 4-10 of Keyes et al. merely indicates that:

> One exemplary method first organizes valuation scores (static and/or probabilistic recoveries) in a computerized system. Adjustments are then made to the valuation scores for special factors and business decisions. Then a reconciliation of multiple valuation scores describing the same asset and an overall adjustment to interview/override the inferred valuation is performed.

As is clear, Keyes et al. merely describes, in a general sense, the organization of valuation scores and adjusting the scores to reconcile/adjust certain valuation scores. Nowhere in this section of Keyes et al. is the random drawing of error values suggested, let alone (and again) estimating the probability of an adverse event. Moreover, it is also clear from the above, that Keyes et al. is directed to reconciling scores "for the same asset," not for matching a distribution of probability values produced by the second mathematical model for a second group of loans and that of a first group of loans. **The Office Action does not specifically address these limitations of claim 11. In the event that the rejection is maintained, clarification is respectfully requested.**

Independent Claim 20

Independent claim 20 recites "estimating a second set of weighting coefficients for a second mathematical model by performing a second regression operation, the second model being a function of only a subset of the predetermined loan parameters and the second set of weighting coefficients, the second set of weighting coefficients being associated with respective ones of the subset of the predetermined set of loan parameters, the second regression operation causing the second mathematical model to produce a probability distribution which is in overall alignment with a probability distribution produced by the first mathematical."

The Office Action relied upon the Abstract, Column 1, line 53-Column 2, line 21, and Column 6, lines 11-65 of Keyes et al. to support the position that the above-described limitations of claim 20 are allegedly taught. Applicant submits that for at least the same reasons described above with regard to claim 11, Keyes et al. fails to suggest estimating a second set of weighting coefficients for a second mathematical model by performing a second regression operation which causes the second mathematical model to produce a probability distribution which is in overall alignment with a probability distribution produced by the first mathematical in the manner set forth in claim 20.

Likewise, independent claim 20 recites "determining the probability of the adverse event using the second mathematical model in connection with a second plurality of loans, including randomly drawing error values from the set of error values and adjusting the outputs of the second mathematical model for the second plurality of loans in accordance with the randomly drawn error values, the randomly drawn error values causing a distribution of the probability values produced by the second mathematical model for the second plurality of loans to more closely match a distribution of the probability values produced by the first mathematical model for the first group of loans." Again, the Office Action relied upon Column 6, lines 4-10 of Keyes

et al. as evidence of the above features of claim 20. Again, and for at least the same reasons as previously discussed with regard to claim 11, Applicant submits that Keyes et al. fails to teach or suggest using error values in the manner set forth in claim 20. **The Office Action does not specifically address these limitations of claim 20. In the event that the rejection is maintained, clarification is respectfully requested.**

Conclusion

Because none of the references cited by the Examiner, either separately or in combination with each other, teach all of the required limitations of independent claims 11 and 20, Applicant submits that each of the these independent claims are patentable over this prior art. Furthermore, because dependent claims 12-16 and 21-23 are each directly or indirectly dependent upon independent claims 11 and 20, Applicant submits that each of these claims are allowable for at least the same reasons as discussed above.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of

papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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By ______________________

Hector A. Agdeppa
Attorney for Applicant
Registration No. 58,238

FOLEY & LARDNER LLP
Customer Number: 34099
Telephone: (312) 832-5165
Facsimile: (312) 832-4700